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CENTRAL INTELLIGENCE AGENCY

REPORT

INFORMATION REPORT

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COUNTRY USSR

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PLACE ACQUIRED Chemical Research at the L.E.N.I (KHIMGAS) Institute, Leningrad

NO. OF ENCLS. 1 (LISTED BELOW)

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SUPPLEMENT TO REPORT NO.

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FORM NO. 51-4F OCT 1951

25 YEAR RE-REVIEW

(20)

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[redacted]

III. APPENDICES

A - F no information
G Scientific Order of Battle, see attached
H Chemical Research, see attached.

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IV. ANNEXURES

A Sketch map (L.E.N.I.) Institute

Appendix "G"

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SCIENTIFIC ORDER OF BATTLE

A. ESTABLISHMENTS

L.E.N.I. Institute, LENINGRAD

In 1947 [redacted] the Institute in LENINGRAD [redacted] was known as KHIMGAS, a scientific institute belonging to a Ministry, thought [redacted] to have been called "Fuel Gas". In 1950 a re-organization took place whereby the Institute became known as L.E.N.I. [redacted] N.I. means Scientific Institute. At that time it became part of the Petroleum Ministry. At the same time a further Institute in LENINGRAD, known as the "High Pressure" Institute was amalgamated with the L.E.N.I. and there was thereafter a general flow of personnel from the High Pressure Institute to the L.E.N.I.

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The L.E.N.I. is located on the south-east outskirts of LENINGRAD at FARFOROVAYA. It consists of two main buildings and a yard on the north-eastern side of the LENINGRAD-MOSCOW railway directly opposite FARFORGVSKY post railway station. A location sketch also showing the Institute layout is given at Annexure 'A'.

B. PERSONNEL

In 1947 the Director of the Institute was Simon Sakharovich LEVIN, but in the same year he was re-appointed a departmental chief and his place taken by SHITKOV, who had formerly held some other appointment in the same Institute. He was assisted by an administrative chief [redacted] there were four main departments in the Institute: LEVIN, had one which was responsible for hydrogenation work; RUDKOVSKI, had a department responsible for Oxosynthesis; KAGAN, had a department for hydro-carbon synthesis, and there was a further department responsible for work on aromatisation [redacted] RUDKOVSKI's department had two sub-departments - one of which was controlled by Madam KETSLER.

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[redacted]

German Specialists at ORANIENBURG

[redacted]

25X1

[redacted] specialists at that location, [redacted] were divied into three sub-groups. The first group is one which apparently did most of the work, and this work, [redacted] was entirely to do with torpedoes with hydrogen peroxide propulsion units. That group consisted of Kurt LAWITSCHKA (who was in charge), Dipl Ing. ABERMETH, who does design work, together with Dipl Ing LOEWIS, SCHOLTZ, who worked on jet regulator control, and MISLOWICZECK. Connected with their work was a concrete bunker which covered a floor space of 15 x 15 metres. They used hydrogen peroxide, hydrazine hydrate and a copper complex salt used to effect the decomposition

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[redacted] 25X1

Appendix 'G'
(Cont'd)

of hydrogen peroxide, hydrazine hydrate and a copper complex salt used to effect the decomposition of hydrogen peroxide. [redacted] 25X1
[redacted] they 25X1
were stored in railway tank wagons and supplied as used. The second group at ORANIENBURG consisted of 3 engineers called KOLB (?), GRAF and JON, who were carrying out work connected with sea mines (possibly acoustic [redacted] 25X1
[redacted] The third group was the high frequency group. This 25X1
consisted of: GLOEDER, Dipl.Ing. MARTIN, who did work on fuses (possibly magnetic and acoustic), completed by 1948, and thereafter, work of measuring equipment such as oscillographs; GREFE (physicist); Professor LUEBKE, who worked with a large indoor water testing tank, possibly carrying out acoustic measurements; Ing. SEDLER; Ing. HILDEBRANDT. Outside the above grouping system, Dr. Glemke, a mathematician, carried out calculations which Dr. POHL believed included torpedo courses: GLEMKE did not, apparently belong to the torpedo group.

Specialists at G.I.P.Kh.

[redacted] the three remaining specialists at the G.I.P.Kh., 25X1
Dr SMEYKEL, OTTO and PEINZE had been posted to RUBEZNOYE. [redacted] 25X1
[redacted] they may be serving a period 25X1
of time during which they are not allowed to give information of their work to other people. The reason for this assumption is not based upon material evidence, but simply called to mind in association with a procedure whereby IG Farben imposed a "Karrenzzeit" in their chemist's contracts (a period of time whereby employees are obliged to maintain strict silence regarding their activities with the firm after they ceased to be employed by them).

[redacted] 25X1

CHEMICAL RESEARCH

1. [redacted] LEUNA WERK 25X1

(a) Main Research Laboratory

[redacted] 25X1

[redacted] This plant was not developed to the production stage because of the danger of losing valuable materials in possible air-raids. [redacted] 25X1 25X1

[redacted] 25X1

(c) Post-war Work at LEUNA

Immediately after the end of the war it was decided to try and produce certain drugs at the LEUNA WERK [redacted] de- velop the preparation of 'Pyramidin'. This failed and no further work was carried out on it. [redacted] preparation of Insulin. The result of this was that an inferior but effective product was prepared and although production started it was very soon dropped, chiefly on account of unavailability of raw materials combined with the product's inferiority. [redacted] 25X1 25X1 25X1 25X1

[redacted] post-war reconstruction of the North Organic Laboratory (as opposed to the organic department of the Main Research Laboratory). This North laboratory consisted of a low pressure lab, high pressure lab, and an analytical lab. As these laboratories became equipped [redacted] carried out the following items of research:- 25X1 25X1 25X1 25X1

1) The preparation of propione aldehyde from propanol using zinc sulphide. From the aldehyde, propionic acid was pre- pared. This was intended as an intermediary for the WOLFEN FILMFABRIK. [redacted] 25X1

[redacted] 25X1

25X1

2) The recovery of ethanol by hydrogenation, for which 7 high pressure chambers were constructed at LEUNA.

3) The preparation of normal propanol: this work was not completed and left in favor of other work.

4) The prepation of contacts for methanol and propionol oxidiation.

5) The recovery of acetic acid using carbon monoxide and methanol.

6) The preparation of methyl acetate.

25X1

2. Transfer to LENINGRAD

On the 22nd October 1946 eleven LEUNA WERK chemists were transported to LENINGRAD - the same time as other specialists were taken to the USSR. The group who arrived at SESTRORETSK (near LENINGRAD) was as follows:-

Dr. ECKOLDT	In the SMA group at LEUNA where he wrote reports.
Dr. KAUFMANN	At LEUNA; Work on the hydrogenation of coal.
Dr. SMEYKAL	At LEUNA; engaged on pharmaceutical work.
Dr. von der HORST-	At LEUNA; worked on propionic acid nitrile.
Dr. PEINZE	Was the LEUNA manager of the methanol and amine factory.
Dr. GRISSLER	In the LEUNA SMA group doing nitration work.
Dr. WYSZOMRISKY	Head of LEUNA material testing department.
Dr. POHL	Organic research etc (as in para.1)
Herr LORENZ	General experimental work in the main laboratory at LEUNA
Herr FRIESE	MOSS BIERBAUM/AUSTRIA: Responsible for Instruments Manager
Herr OTTO	LEUNA design office

25X1

25X1

'Appendix H'
3rd page

25X1

(b) Ester Oils

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These esters were made from by-products of isobutanol synthesis and consisted of adipic acid methanol and primary alcohols washed with caustic soda solution and distilled at low pressure. The resulting esters gave a range of lubricants of varying viscosities from thick to medium oils. However, higher alcohols being not available, the attempts were not at first successful. Alcohols from the oxo synthesis were later available

25X1

25X1

(c) Production of a compound P.3

compound P.3 (Trimethylol-Ethane) 25X1

process as follows:-

1) $CH_3 - CH_2 - C(=O)H$ obtained from $CH_3 - CH_2 OH$

$HC(=O)H$ obtained from $CH_3 OH$

2) $CH_3 - CH_2 - C(=O)H + 2\,HC(=O)H \longrightarrow CH_3 - C(CH_2OH)(CH_2O-C(=O)H)(CH_2OH)$

$CH_3 - C(CH_2OH)(CH_2O-C(=O)H)(CH_2OH) + HC(=O)H \longrightarrow CH_3 - C(CH_2OH)_3 \xrightarrow{CaO} + HCOOH$

'P3'

this was to be used as an explosive after nitration. 25X1

This compound, however, 25X1

use in the production of synthetic glycerine. 25X1

25X1

the sulphur and calcium salts 25X1
present as impurities in the finished product prevented the complete nitration and thus the application of this compound as an explosive. 25X1

25X1

(d) Antioxident inhibitor for synthetic lubricant

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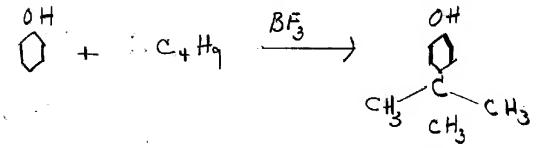
25X1

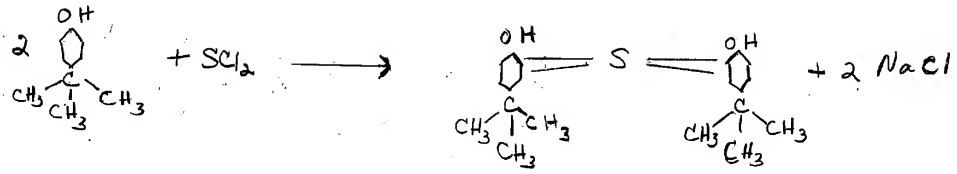
A priority was laid down requiring both inhibitors to be prepared by the beginning of June 1949. This was the only priority ever given by the Russians to work carried out by Germans 25X1

The reason for this time limit was not known 25X1

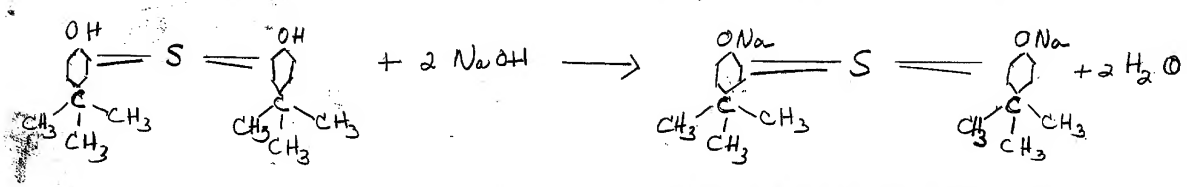
the plant for the manufacture of these inhibitors was so elementary that the Russians would undoubtedly have no difficulty in putting the process on the production level. The antioxidant inhibitor is a tin compound prepared as follows: 25X1



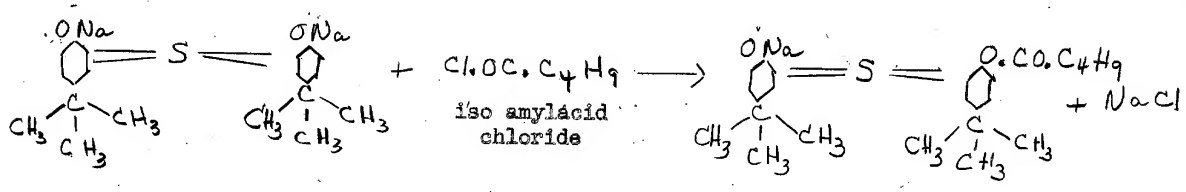
para tetiary isobutyl phenol.

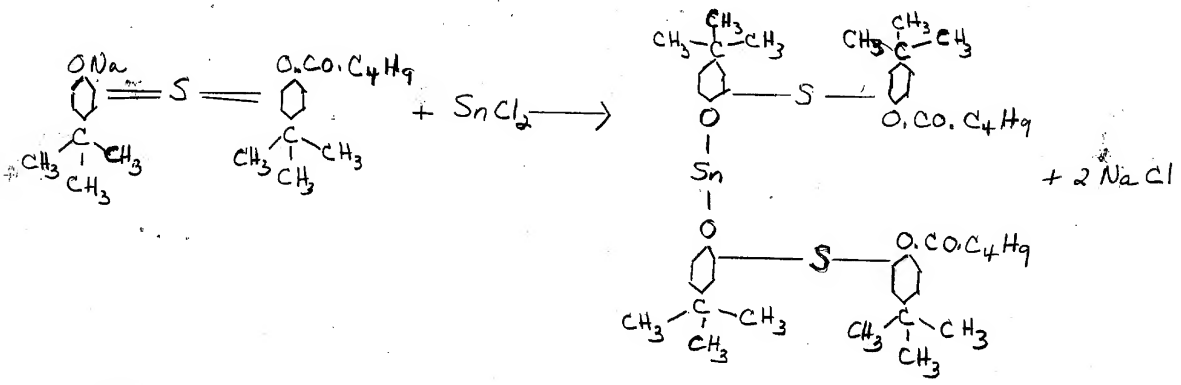


di-isobutyl diphenyl sulphide



sodium phenolate of di-isobutyl





Inhibitor

The application of this inhibitor was to make a 50% solution of it in SS 906 synthetic lubricant taken from the first run. This solution was then mixed with SS 906 synthetic lubricant giving a solution percentage of 0.02% proportion of the mixure. Besides having the effect of an antioxidant preventing the formation of gummy substances, the inhibitor had the effect of giving a higher viscosity index, with a depressed power print.

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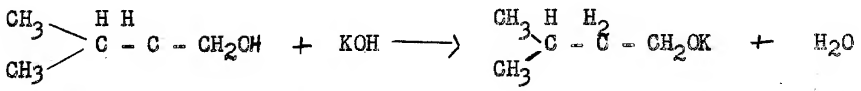
25X1

25X1

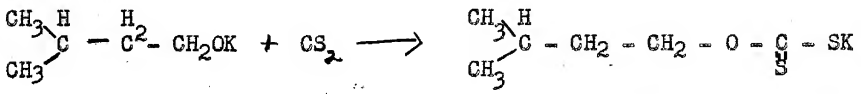
'Appendix H'
5th page

(e) Anti-corrosion inhibitor for synthetic lubricant

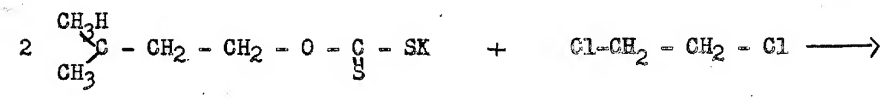
The preparation of an anti-corrosion inhibitor which had the LEUNA WERK trade name of MESULFOL was included in the priority with the antioxidant described in para.(d) above. MESULFOL, besides being an anticorrosion inhibitor provided increased lubrication efficiency for higher pressures and applied as a component of weapon oil. In Germany weapon oil was a mixture of mineral oils, ester oils and a natural oil extracted from pigs claws. This natural oil was replaced in the mixture by SS 906 synthetic lubricant which had 4% of MESULFOL inhibitor in it. The preparation of this inhibitor is as follows:-

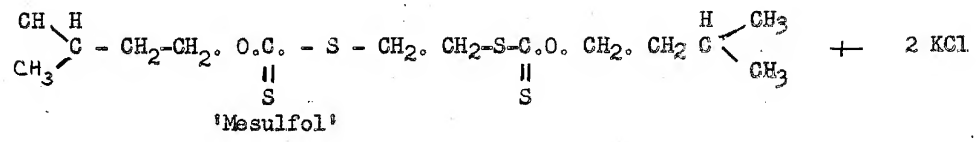


Iso-amyl-alcohol



Iso-amylxanthogenate potassium





'Mesulfol'

25X1

(f) Adipic Acids

25X1

At the LEUNA WERK there was a plant for the production of adipic acid which the Russians had dismantled and taken to Russia complete with the personnel operating it. erected in DZERZHINSK. 25X1
The process was where vinyl, cresyl and para-isobutyl phenol are oxidised to adipic acids.
However, it appears that the Russians did not seem to have any interest in 25X1
adipic acid outside nylon production 25X1

(g) Hydrogenation Group

the Hydrogenation group consisted of 25X1
KAUFMANN and LORENZ. Since coming to the Institute these two had been employed at the re-erection of a LEUNA WERK twin-stall hydrogenation plant for the hydrogenation of tar. At this work they did no active research, 25X1
it consisted merely of actual reconstruction, calculations and measurements conducted in connection with the running of the plant, etc.
the first six months work was on the partial hydrogenation of naphthol in an autoclave. This included the preparation of nickel, chromium and Atkin's contacts.

25X1

[redacted] 25X1

[redacted] 25X1

4. General observations regarding conditions in the L.E.N.I.

(a) [redacted] the equipment was restricted to glass flasks all of which bore the JENA trademark, and an extremely 25X1
restricted number of chemicals: this gave a catastrophic effect in comparison to what they were accustomed as research chemists in the LEUNA WERK laboratories. During the whole time they spent at L.E.N.I. their equipment was very gradually increased so that by the time of their repatriation they had the laboratory almost equipped up to the LEUNA WERK standard.

(b) Most of the glass equipment which they received at L.E.N.I. was stamped 25X1
JENA [redacted] this was up to JENA's normal standard. However, included among it was always a proportion of Russian glassware which was inferior as far as they were concerned for two main reasons: the first of these was that the glass itself was inferior and the equipment would break after being used two or three times; secondly the gradation and markings on glassware was clumsy and confusing to the Germans. They therefore chose to use German glassware all the time [redacted] 25X1
[redacted] Russian thermometers with which they worked were definitely inaccurate and had to be standardized by comparison with German thermometers and a conversion formula calculated for each.

(c) Regarding Russian non-glass laboratory equipment such as chemical balances [redacted] although apparently accurate they were outmoded and 25X1
similar in design to what one expects to find only in educational establishments.

(d) [redacted] the Russian chemicals [redacted] were impure. 25X1
25X1

(e) Regarding laboratory staff [redacted] the laboratory assistant 25X1
was a type who completely unskilled in laboratory work and their numbers in the Institute were very limited. Their place was taken by a higher number of chemists than one would expect in a European laboratory of similar nature. The standard of education of these chemists [redacted] have been affected by a general 25X1
shortage of laboratory equipment prevalent in the USSR. That this shortage existed was evident [redacted] since not only Russians from other laboratories [redacted] 25X1
[redacted] but research staff visiting from LENINGRAD Universities begged to take away even ordinary glass equipment [redacted] since this state of affairs could be made apparent [redacted] it must reflect a serious shortage of equipment allotted for educational purposes. A further reflection was the undoubted lack of practical ability which newly qualified chemists possessed when joining the Institute straight from the University. Those coming to work [redacted] lacked both practical skill and that type of knowledge which is 25X1
only gained by practical experience: on the other hand theoretical knowledge which comes from reading alone had apparently been well instructed and learned. The way in which these chemists took to practical work was various. Those who had an interest in it were as quick, if not quicker, than the average European student in acquiring skill in research. There were, however, a large proportion of chemists who had no interest in the work since apparently, the Russian educational system is not one of free will and University undergraduates are allotted to science subjects according to some system, possibly of supply and demand, as opposed to the choice of the student. Thus, chemists were being trained who never in their lives would become efficient research workers. [redacted] 25X1
[redacted] Russian chemists [redacted] never derive any pleasure from their work, being affected the whole time by fear instead. Their fear that

[redacted] 25X1

things might be seen to have gone wrong by their superiors is sufficient to guide them away from any measure of interest to complete a research assignment. A small illustration [redacted] supposes that a distillation apparatu 25X1 breaks durings its operation in the laboratory. The Russians are courageous enough to approach the broken apparatus in order to put out the fire etc., but then their next instinct, instead of opening all the doors and windows to let out the fumes as one would expect, is to rush madly to all the doors and windows and lock them in order to have the whole thing tidied up before their superiors find out anything about it.

- end -

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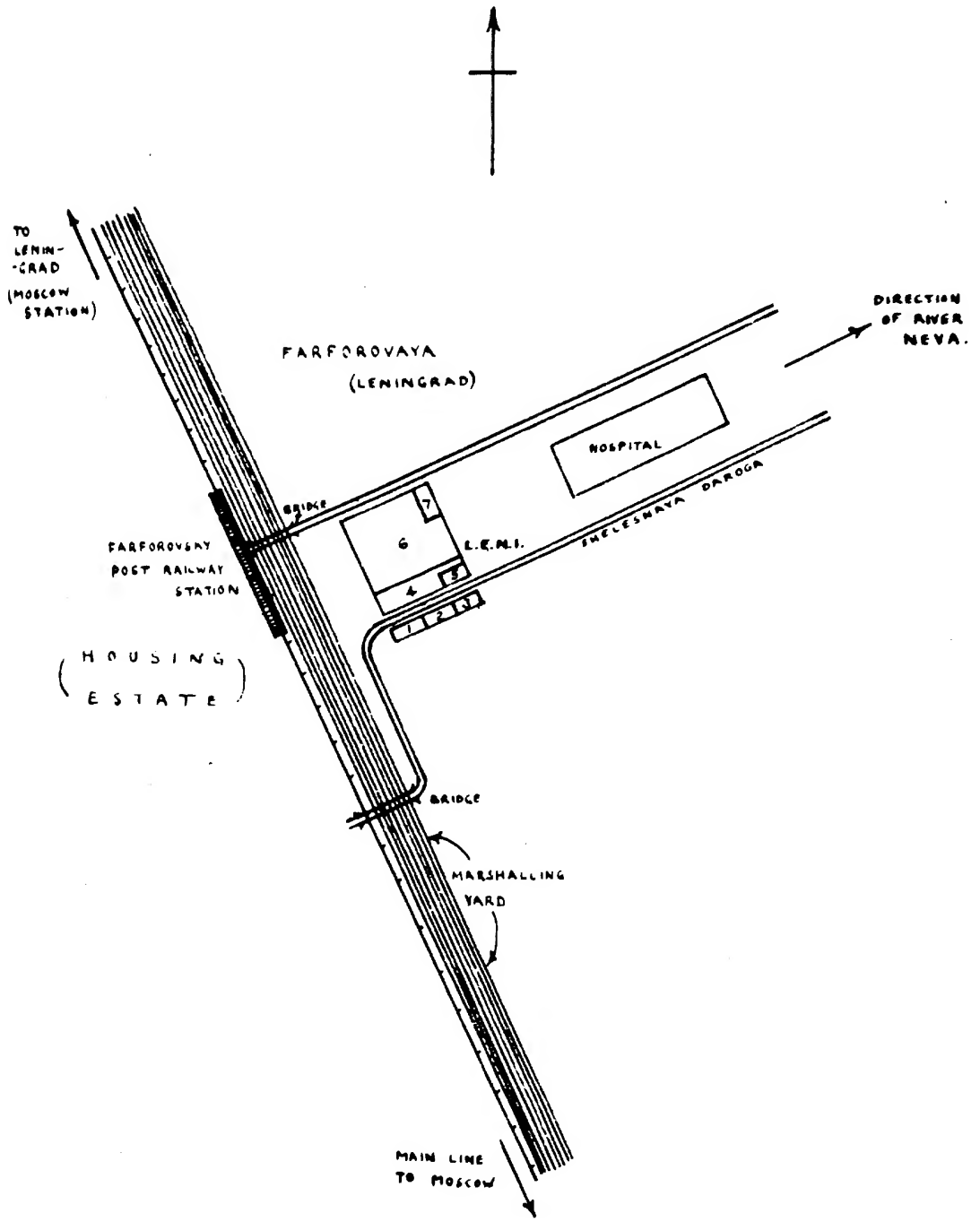

ANNEXURE 'A'

LOCATION & LAY-OUT OF THE L.E.N.I. (FORMERLY 'KHIMGAS' INSTITUTE)

KEY (L E N I.)

INSTITUTE BUILDING
1 - BOILER HOUSE & POWER PLANT
2 - ACCOMMODATION FOR RUSSIANS
3 - ADMINISTRATION OFFICES

INSTITUTE BUILDING
4 - LABORATORIES (3 STOREYS)
5 - TECHNICAL ROOMS (GROUND)

INSTITUTE GROUNDS
6 - YARD WITH FITTING SHOPS
7 - HYDROGENATION PLANT (EX LEUNA)

25X1